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VINETIC®

Voice and Internet Enhanced Telephony Interface Circuit

T.38 Fax Relay Package Release 1.2.1.2

CONFIDENTIAL
Distribution with NDA only

Evaluation Report

Interoperability Testing
Revision 1.0

Communication Solutions

Never stop thinking

Edition 2006-06-22

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Preface

Infineon Technologies provides a competitive solution for Fax services over IP for the VINETIC® family devices.

The T.38 Fax Relay package includes the T.38 Protocol Stack, the T.38 Fax Agent, a T.38 Test Application software and the documentation.

This document covers the End-to-End interoperability tests for Group 3 Facimile Equipment (G3FE).

Organization of this document

This document is divided into 4 chapters. It is organized as follows:

- **Chapter 1** describes the test requirements and gives an overview of the test setup.
- **Chapter 2** shows the test results.
- **Chapter 3** gives an overview of the used interoperability reference test equipment.
- **Chapter 4** describes known issues for T.38 interoperability.

1 Overview

The End-to-End test ensures compatibility between G3FE devices and the T.38 Protocol Stack implementation. The evaluation report in **Chapter 2** shows the test cases for the G3FE devices together with the test results. An overview of all available G3FE devices is given in **Chapter 3.1**.

1.1 Goal of the G3FE Interoperability Testing

- Compatibility
  - During testing the device sends and receives Fax calls for the selected profile (e.g. Panasonic, Brother,...)
- Protocol Testing
  - The Test Equipment performs protocol analysis and identifies errors during the Fax transmission.
- Quality of Image
- End-to-End Testing
  - The test equipment verifies timing delays, facsimile transmission parameters and facsimile training check sequence anomalies for T.30 which can corrupt the facsimile call.
- T.38 Testing
  - The test equipment verifies Fax message degradations which are caused by the network and Fax protocol violations.

The facsimile is transmitted through a complex network protocol. According to **Figure 1** the G3FE Interoperability verifies the communication between the real world Fax device and the Infineon T.38 implementation.

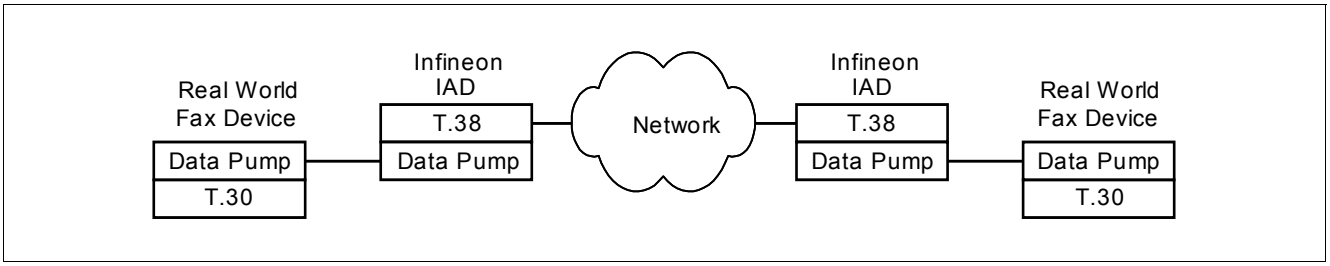

Figure 1 G3FE Interoperability Overview

1.2 Test Requirements

Table 1 gives an overview of the system components under test.

Table 1 Test Requirement Definition

Component	Version
System Under Test (SUT)	EASY 334
EDSP Firmware	4VIP6-RTP4 Rel.16.15.56.V1.4, 4VIP7-RTP4 Rel.20.15.56.V1.4, 4VIP8-RTP4 Rel.24.15.56.V1.4
Device Driver	VINETIC® Device Driver V1.1.16
T.38 Protocol Stack	Release 1.21
T.38 Fax Agent	Release 1.1
T.38 Test Application	Release 1.1
Signaling Protocol Stack	n/a

1.3 Test Setup for G3FE Interoperability

For the G3FE Interoperability the FaxLab Version 4.5 test equipment from Quality Logic is used. FaxLab provides a comprehensive set of G3FE profiles which are shown under **Chapter 3.1**.

The Fax calls are tested on parallel channels to ensure that parallel calls does not disturb each other.

For each Fax transmission (profile) the Figure Of Merit is measured to evaluate the quality of the transmission. The Figure Of Merit (FOM) is part of the recommendations ITU-T E.453 **[10]** and ITU-T E.458 **[11]** and shows the results for the call success and the image quality.

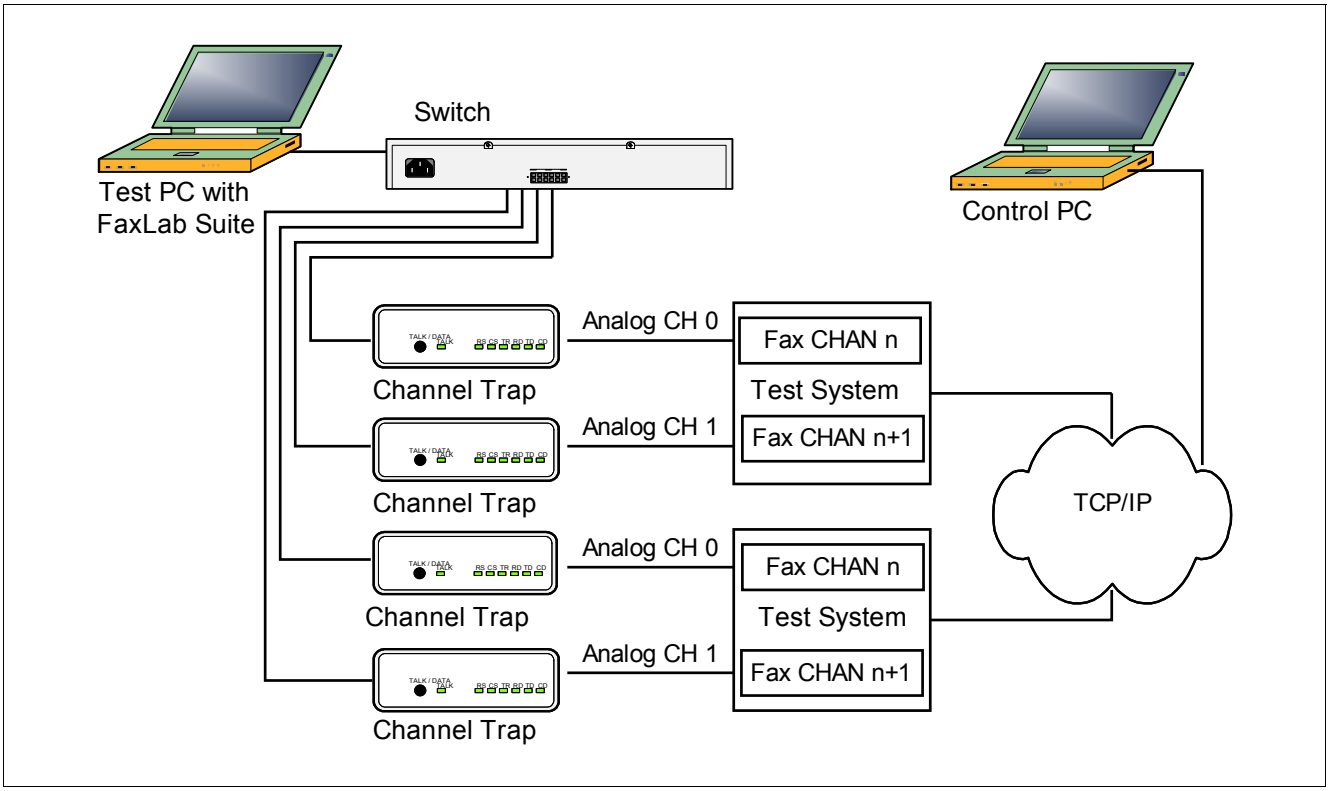

Figure 2 Test Setup

The parameters are optimized for the facsimile transmission and recommended for the system implementation. T.38 Protocol Stack parameters used for tests are configured using t38.ini file and are presented in **Table 2**.

Table 2 T.38 Protocol Stack Parameters

T.38 Parameter Name	Parameter Description	Value	Comment
iOptions	Configurable T.38 options	0x06	Activates non-standard frame handling (patching) and forces T.38 to use 1998 ASN.1 syntax version 0
uiDBmLevel	Modulator output signal power	10	-10 dBm
uiDataWaitTime	Time for buffering T.30/T.4 data before start of modulation	50	500 ms
uiUdpHighRateErrRecoveryPackets	Number of high rate recovery packets to send during training and page data transmission	0	

Table 2 T.38 Protocol Stack Parameters (cont'd)

T.38 Parameter Name	Parameter Description	Value	Comment
uiUdpLowRateErrRecoveryPackets	Number of low rate recovery packets to send during T.30 control data transmission	0	
uiUdpIndicatorDuplicationPackets	Number of recovery packets to send for T30_INDICATOR packets	0	
uiUdpPriorPacketsForFEC	Number of packets to calculate recovery packet in FEC error correction mode	0	
pucNsxInfoField	Value for patch information field of non-standard facilities frames	0x12ab5e	Value given by test application.
uiNsxInfoFieldSz	Size of information field	3	
unGain1	Demodulation gain	96	Unity gain
unGain2	Modulation gain	128	Unity gain
unMOBSM	Level for starting modulation from modulation buffer	320	200 ms
unMOBRD	Level for requesting more data for modulation	233	146 ms
unDMBSD	Send level for demodulation output buffer	32	20 ms
uiAutoStartWaitTime	Wait time for response to facsimile command automatic modulation	2900	2900 ms
uiAutoSpoofingTime	Spoofing time for automatic modulation	30	300 ms
Maxbitrate	Maximum permissible bit rate for session	144	No limit for version 0
udpEC	Error Correction Mode	1	Redundancy
ratemng	TCF training signal generation mode	2	Transferred TCF
uiTransportProtocol	Transport protocol	1	UDP (UDPTL)
ucVersion	T.38 version	0	
uiBitOptions	Options of T.38	0	Not supported
unUDPMaxBufferSize	Maximum number of octets can be stored before overflow	4096	
unUDPMaxDatagramSize	Maximum size of UDPTL packet	512	

2 Interoperability Evaluation

2.1 G3FE Interoperability Evaluation

This chapter describes the test results for the End-to-End interoperability tests. For each test case the Quality of Service is measured. The relative quality of the Fax call is reported against the ITU-T Figure of Merit (FOM).

Table 3 Figure of Merit (FOM)

FOM	Fax Call Complete	Maximum Speed	Image Quality
1	Yes	Yes	Error Free
2	Yes	Yes	Errored
3	Yes	Yes	Severly Errored
4	Yes	Yes	Error Free
5	Yes	Yes	Errored
6	Yes	Yes	Severly Errored
7	No	Not Applicable	Not Applicable

Table 4 G3FE Test Report

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
001	T.30 Synthesized Profile	MMR, ECM, 200x100	V.17 14400	1
002	AT/T PPF200	MMR, ECM, 200x100	V.29 9600	1
003	Brother 6650MC	MMR, ECM, 200x100	V.17 14400	1
004	Brother 7150C	MMR, ECM, 200x100	V.17 14400	1
005	Brother MFC 4600	MMR, ECM, 200x100	V.17 14400	1
006	Brother MFC 4650	MMR, ECM, 200x100	V.17 14400	1
007	Brother MFC 4550	MMR, ECM, 200x100	V.17 14400	1
008	Canon Fax B340	MMR, ECM, 200x100	V.17 14400	1
009	Canon Fax TF 301	MMR, ECM, 200x100	V.29 9600	1
010	Canon L 777	MMR, ECM, 200x100	V.17 14400	1
011	Canon Multi Pass C2500	MMR, ECM, 200x100	V.17 14400	1
012	Canon Multi Pass C530	MMR, ECM, 200x100	V.17 14400	1
013	Canon Multi Pass C545	MMR, ECM, 200x100	V.17 14400	1
014	Canon Multi Pass C555	MMR, ECM, 200x100	V.17 14400	1
015	Canon Multi pass C560	MMR, ECM, 200x100	V.17 14400	1
016	Canon Multi Pass C755	MMR, ECM, 200x100	V.17 14400	1
017	Canon Multi Pass L6000	MMR, ECM, 200x100	V.17 14400	1
018	Fujitsu Dex 740	MMR, Non-ECM, 200x100	V.29 9600	1
019	Hewlett Packard Fax 920	MMR, ECM, 200x100	V.17 14400	1
020	Hewlett Packard Fax 200	MMR, ECM, 200x100	V.29 9600	1
021	Hewlett Packard Laser Jet 3200	MMR, ECM, 200x100	V.17 14400	1
022	Hewlett Packard Office Jet	MMR, ECM, 200x100	V.29 9600	1
023	Hewlett Packard Office Jet 350	MMR, ECM, 200x100	V.29 9600	1

Table 4 G3FE Test Report (cont'd)

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
024	Hewlett Packard Office Jet 570	MMR, ECM, 200x100	V.17 14400	1
025	Lumina 2096	MMR, ECM, 200x100	V.29 9600	1
026	Mita LDC 750	MMR, ECM, 200x100	V.17 14400	1
027	Monroe MX 4020	MMR, ECM, 200x100	V.29 9600	1
028	Motorola Power 14.4 (WinFax)	MMR, ECM, 200x100	V.17 14400	1
029	Muratec F150	MMR, ECM, 200x100	V.17 14400	1
030	Muratec F 56	MMR, ECM, 200x100	V.17 14400	1
031	Muratec F 90	MMR, ECM, 200x100	V.17 14400	1
032	NEC Nefax 480	MMR, ECM, 200x100	V.17 14400	1
033	Okidata Okifax 1000	MMR, ECM, 200x100	V.29 9600	1
034	Okidata Okifax 2200	MMR, ECM, 200x100	V.29 9600	1
035	Okidata OkiOffice 84	MMR, ECM, 200x100	V.17 14400	1
036	Panasonic PX 350	MMR, ECM, 200x100	V.29 9600	1
037	Panasonic PX 5	MMR, ECM, 200x100	V.29 9600	1
038	Panasonic UF 880	MMR, ECM, 200x100	V.17 14400	1
039	Panasonic UF V60	MMR, ECM, 200x100	V.29 9600	1
040	Ricoh 180	MMR, ECM, 200x100	V.29 9600	1
041	Ricoh 3500L	MMR, ECM, 200x100	V.17 14400	1
042	Ricoh Fax 240	MMR, ECM, 200x100	V.29 9600	1
043	Ricoh Fax 3000L	MMR, ECM, 200x100	V.29 9600	1
044	Sharp FO 5400	MMR, ECM, 200x100	V.17 14400	1
045	Sharp UX 1400	MMR, ECM, 200x100	V.17 14400	1
046	Sharp UX 3600M	MMR, ECM, 200x100	V.17 14400	1
047	Toshiba TF 421	MMR, ECM, 200x100	V.29 9600	1
048	Toshiba TF 671	MMR, ECM, 200x100	V.17 14400	1
049	US Robotics 33.6 Mdl 1172 (Microsoft)	MMR, ECM, 200x100	V.29 9600	1
050	Xerox 3004	MMR, ECM, 200x100	V.17 14400	1
051	Xerox 7033	MMR, ECM, 200x100	V.17 14400	1
052	Xerox Work Center 250	MMR, ECM, 200x100	V.29 9600	1
053	Xerox Work Center 470cx	MMR, ECM, 200x100	V.17 14400	1
054	Xerox Work Center 480cx	MMR, ECM, 200x100	V.17 14400	1
055	Xerox Work Center XK50cx	MMR, ECM, 200x100	V.17 14400	1
056	3 COM EtherLink III LAN 33.6	MH, ECM, 200x100	V.17 14400	1
057	AT/T9015PF	MH, Non-ECM, 200x100	V.29 9600	1
058	AT/T Data Port	MH, Non-ECM, 200x100	V.17 14400	1
059	AT/T PPF200	MH, ECM, 200x100	V.29 9600	1
060	Boca MV34E	MH, Non-ECM, 200x100	V.17 14400	1
061	Brother 6650MC	MH, ECM, 200x100	V.17 14400	1
062	Brother 7150C	MH, ECM, 200x100	V.17 14400	1
063	Brother Fax 190	MH, Non-ECM, 200x100	V.29 9600	1

Table 4 G3FE Test Report (cont'd)

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
064	Brother Fax 580 MC	MH, ECM, 200x100	V.17 14400	1
065	Brother Intellifax 2500	MH, Non-ECM, 200x100	V.29 9600	1
066	Brother Intellifax 600	MH, Non-ECM, 200x100	V.29 9600	1
067	Brother Intellifax 625	MH, Non-ECM, 200x100	V.29 9600	1
068	Brother Intellifax 950M	MH, Non-ECM, 200x100	V.29 9600	1
069	Brother MFC 4600	MH, ECM, 200x100	V.17 14400	1
070	Brother MFC 4650	MH, ECM, 200x100	V.17 14400	1
071	Brother MFC 4550	MH, ECM, 200x100	V.17 14400	1
072	Canon B70	MH, Non-ECM, 200x100	V.29 9600	1
073	Canon Fax 750	MH, ECM, 200x100	V.29 9600	1
074	Canon Fax B340	MH, ECM, 200x100	V.29 9600	1
075	Canon Fax TF 301	MH, ECM, 200x100	V.29 9600	1
076	Canon L777	MH, ECM, 200x100	V.17 14400	1
077	Canon Multi Pass C2500	MH, ECM, 200x100	V.17 14400	1
078	Canon Multi Pass C530	MH, ECM, 200x100	V.17 14400	1
079	Canon Multi Pass C545	MH, ECM, 200x100	V.17 14400	1
080	Canon Multi Pass C5500	MH, ECM, 200x100	V.17 14400	1
081	Canon Multi Pass C555	MH, ECM, 200x100	V.17 14400	1
082	Canon Multi Pass C560	MH, ECM, 200x100	V.17 14400	1
083	Canon Multi Pass C755	MH, ECM, 200x100	V.17 14400	1
084	Canon Multi Pass L6000	MH, ECM, 200x100	V.17 14400	1
085	Cardinal	MH, ECM, 200x100	V.17 14400	1
086	Compaq 9600 PCMCIA	MH, ECM, 200x100	V.29 9600	1
087	Eiger 14.4 PCMCIA	MH, Non-ECM, 200x100	V.17 14400	1
088	Fujitsu Dex 740	MH, Non-ECM, 200x100	V.29 9600	1
089	Fujitsu Dex 85	MH, Non-ECM, 200x100	V.17 14400	1
090	Gammalink Fax Modem	MH, ECM, 200x100	V.17 14400	1
091	Global Village Teleport Bronze II	MH, Non-ECM, 200x100	V.27 4800	1
092	Hayes JetFax	MH, Non-ECM, 200x100	V.29 9600	1
093	Hayes Optima 14.4	MH, ECM, 200x100	V.17 14400	1
094	Hewlett Packard Fax 920	MH, ECM, 200x100	V.17 14400	1
095	Hewlett Packard Fax 200	MH, ECM, 200x100	V.29 9600	1
096	Hewlett Packard LaserJet 3200	MH, ECM, 200x100	V.17 14400	1
097	Hewlett Packard OfficeJet	MH, ECM, 200x100	V.29 9600	1
098	Hewlett Packard OfficeJet 350	MH, ECM, 200x100	V.29 9600	1
099	Hewlett Packard Office Jet 570	MH, ECM, 200x100	V.17 14400	1
100	Intel SatisFAXtion 400e	MH, ECM, 200x100	V.29 9600	1
101	Konica 7310	MH, ECM, 200x100	V.29 9600	1
102	Lumina 2096	MH, ECM, 200x100	V.29 9600	1
103	Megahertz PCMCIA card	MH, Non-ECM, 200x100	V.17 14400	1

Table 4 G3FE Test Report (cont'd)

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
104	Minolta 3300	MH, Non-ECM, 200x100	V.29 9600	1
105	Mita LDC 570	MH, ECM, 200x100	V.17 14400	1
106	Mita TC 750	MH, ECM, 200x100	V.17 14400	1
107	Mita TC 170	MH, ECM, 200x100	V.29 9600	1
108	Monroe MX 4020	MH, ECM, 200x100	V.29 9600	1
109	Motorola CELLect 14.4 (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
110	Motorola Power 14.4 (FaxTalk)	MH, Non-ECM, 200x100	V.17 14400	1
111	Motorola Power 14.4 (BitFax)	MH, ECM, 200x100	V.17 14400	1
112	Motorola Power 14.4 (FaxWorks)	MH, Non-ECM, 200x100	V.17 14400	1
113	Motorola Power 14.4 (Quicklink)	MH, Non-ECM, 200x100	V.17 14400	1
114	Motorola Power 14.4 (WinFax)	MH, ECM, 200x100	V.17 14400	1
115	Motorola UDS 14.4 (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
116	Muratec F150	MH, ECM, 200x100	V.17 14400	1
117	Muratec F56	MH, ECM, 200x100	V.17 14400	1
118	Muratec F90	MH, ECM, 200x100	V.17 14400	1
119	Muratec Imagmate CX	MH, ECM, 200x100	V.29 9600	1
120	Muratec M820	MH, Non-ECM, 200x100	V.29 9600	1
121	NEC Nefax 480	MH, ECM, 200x100	V.17 14400	1
122	NEC SilentWriter 95	MH, ECM, 200x100	V.29 9600	1
123	New media 14.4 PCMCIA (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
124	Okidata OkiFax 1000	MH, ECM, 200x100	V.29 9600	1
125	Okidata OkiFax 2200	MH, ECM, 200x100	V.29 9600	1
126	Okidata OkiOffice 84	MH, ECM, 200x100	V.17 14400	1
127	Olivetti OFX-1000	MH, ECM, 200x100	V.29 9600	1
128	Olivetti OFX 3100	MH, ECM, 200x100	V.29 9600	1
129	Panasonic KX F1600	MH, Non-ECM, 200x100	V.29 9600	1
130	Panasonic KX F3000	MH, Non-ECM, 200x100	V.29 9600	1
131	Panasonic KX F500	MH, Non-ECM, 200x100	V.29 9600	1
132	Panasonic KX F580	MH, Non-ECM, 200x100	V.29 9600	1
133	Panasonic KX FP 270	MH, Non-ECM, 200x100	V.17 14400	1
134	Panasonic KX FP C95	MH, Non-ECM, 200x100	V.17 14400	1
135	Panasonic PX 150	MH, ECM, 200x100	V.29 9600	1
136	Panasonic PX 350	MH, ECM, 200x100	V.29 9600	1
137	Panasonic PX 5	MH, ECM, 200x100	V.29 9600	1
138	Panasonic UF 880	MH, ECM, 200x100	V.17 14400	1
139	Panasonic UF V60	MH, ECM, 200x100	V.29 9600	1
140	Pitney Bowes 8050	MH, ECM, 200x100	V.29 9600	1
141	Practical Peripherals V.32bis	MH, ECM, 200x100	V.17 14400	7
142	Ricoh 180	MH, ECM, 200x100	V.29 9600	1
143	Ricoh 3500L	MH, ECM, 200x100	V.17 14400	1

Table 4 G3FE Test Report (cont'd)

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
144	Ricoh Fax 240	MH, ECM, 200x100	V.29 9600	1
145	Ricoh Fax 3000L	MH, ECM, 200x100	V.29 9600	1
146	Ricoh RF 05	MH, Non-ECM, 200x100	V.29 9600	1
147	Samsung FX 1502	MH, Non-ECM, 200x100	V.29 9600	1
148	Samsung FX 40	MH, Non-ECM, 200x100	V.29 9600	1
149	Sanyo SFX 11	MH, Non-ECM, 200x100	V.29 9600	1
150	Sanyo SPF 301	MH, ECM, 200x100	V.29 9600	1
151	Scout 14.4 PCMCIA	MH, ECM, 200x100	V.17 14400	1
152	Sharp FO 145	MH, Non-ECM, 200x100	V.29 9600	1
153	Sharp FO 235	MH, Non-ECM, 200x100	V.29 9600	1
154	Sharp FO 445	MH, Non-ECM, 200x100	V.29 9600	1
155	Sharp FO 5400	MH, ECM, 200x100	V.17 14400	1
156	Sharp UX 104	MH, Non-ECM, 200x100	V.29 9600	1
157	Sharp UX 108	MH, Non-ECM, 200x100	V.29 9600	1
158	Sharp UX 117	MH, Non-ECM, 200x100	V.29 9600	1
159	Sharp UX 1400	MH, ECM, 200x100	V.17 14400	1
160	Sharp UX 256	MH, Non-ECM, 200x100	V.29 9600	1
161	Sharp UX 3600M	MH, ECM, 200x100	V.17 14400	1
162	Sharp UX 460	MH, Non-ECM, 200x100	V.29 9600	1
163	Supra 28.8 MacIntosh	MH, Non-ECM, 200x100	V.17 14400	1
164	Supra Fax Modem V.32bis (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
165	Supra Fax Modem V.32bis (WinFax)	MH, Non-ECM, 200x100	V.17 14400	1
166	Telecom AM 11	MH, Non-ECM, 200x100	V.29 9600	1
167	Telecom NP 80	MH, Non-ECM, 200x100	V.29 9600	1
168	Toshiba TF 231	MH, Non-ECM, 200x100	V.29 9600	1
169	Toshiba TF 421	MH, ECM, 200x100	V.29 9600	1
170	Toshiba TF 501	MH, ECM, 200x100	V.29 9600	1
171	Toshiba TF 671	MH, ECM, 200x100	V.17 14400	1
172	US Robotics Sportster (Quicklink)	MH, Non-ECM, 200x100	V.17 14400	1
173	US Robotics Sportster 14.4 (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
174	US Robotics Sportster 28.8 (MacIntosh)	MH, Non-ECM, 200x100	V.17 14400	1
175	US Robotics WorldPort PCMCI(FaxTalk)	MH, ECM, 200x100	V.17 14400	1
176	US Robotics 33.6 Mdl 1172 (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
177	US Robotics 33.6 Mdl 1172 (Microsoft)	MH, ECM, 200x100	V.29 9600	1
178	US Robotics 33.6 Mdl 1172 (WinFax)	MH, ECM, 200x100	V.17 14400	1
179	Viva 14.4 Fax Modem	MH, Non-ECM, 200x100	V.17 14400	2
180	Xerox 3004	MH, ECM, 200x100	V.17 14400	1
181	Xerox 7021	MH, ECM, 200x100	V.29 9600	1
182	Xerox 7024	MH, ECM, 200x100	V.17 14400	1
183	Xerox 7033	MH, ECM, 200x100	V.29 9600	1

Table 4 G3FE Test Report (cont'd)

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
184	Xerox Work Center 250	MH, ECM, 200x100	V.29 9600	1
185	Xerox Work Center 470cx	MH, ECM, 200x100	V.17 14400	1
186	Xerox Work Center 480cx	MH, ECM, 200x100	V.17 14400	1
187	Xerox Work Center XE90cx	MH, ECM, 200x100	V.17 14400	1
188	Xerox Work Center XK50cx	MH, ECM, 200x100	V.17 14400	1
189	Zoom Telephonics 14.4 Internal (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
190	Zoom Telephonics 9600 Internal (FaxTalk)	MH, ECM, 200x100	V.29 9600	1
191	Zoom Telephonics V.32 bis (FaxTalk)	MH, ECM, 200x100	V.17 14400	1
192	ZyXEL Omni 288S (FaxTalk)	MH, Non-ECM, 200x100	V.17 14400	1
193	ZyXEL U-1496E (FaxTalk)	MH, Non-ECM, 200x100	V.17 14400	1
194	T.30 Synthesized Profile	MH, ECM, 200x100	V.17 14400	1
195	3 COM EtherLink III LAN 33.6	MR, ECM, 200x100	V.17 14400	1
196	AT/T PPF200	MR, ECM, 200x100	V.29 9600	1
197	Boca MV34E	MR, Non-ECM, 200x100	V.17 14400	2
198	Brother 6650MC	MR, ECM, 200x100	V.17 14400	1
199	Brother 7150C	MR, ECM, 200x100	V.17 14400	1
200	Brother MFC 4600	MR, ECM, 200x100	V.17 14400	1
201	Brother MFC 4650	MR, ECM, 200x100	V.17 14400	1
202	Brother MFC 4550	MR, ECM, 200x100	V.17 14400	1
203	Canon B70	MR, Non-ECM, 200x100	V.29 9600	1
204	Canon Fax 750	MR, ECM, 200x100	V.29 9600	1
205	Canon Fax B340	MR, ECM, 200x100	V.29 9600	1
206	Canon Fax TF 301	MR, ECM, 200x100	V.29 9600	1
207	Canon L777	MR, ECM, 200x100	V.17 14400	1
208	Canon Multi Pass C2500	MR, ECM, 200x100	V.17 14400	1
209	Canon Multi Pass C530	MR, ECM, 200x100	V.17 14400	1
210	Canon Multi Pass C545	MR, ECM, 200x100	V.17 14400	1
211	Canon Multi Pass C5500	MR, ECM, 200x100	V.17 14400	1
212	Canon Multi Pass C555	MR, ECM, 200x100	V.17 14400	1
213	Canon Multi Pass C560	MR, ECM, 200x100	V.17 14400	1
214	Canon Multi Pass C755	MR, ECM, 200x100	V.17 14400	1
215	Canon Multi Pass L6000	MR, ECM, 200x100	V.17 14400	1
216	Cardinal	MR, ECM, 200x100	V.17 14400	1
217	Compaq 9600 PCMCIA	MR, ECM, 200x100	V.29 9600	1
218	Eiger 14.4 PCMCIA	MR, Non-ECM, 200x100	V.17 14400	2
219	Fujitsu Dex 740	MR, ECM, 200x100	V.29 9600	7
220	Fujitsu Dex 85	MR, Non-ECM, 200x100	V.17 14400	1
221	Gammalink Fax Modem	MR, ECM, 200x100	V.17 14400	1
222	Hayes Optima 14.4	MR, ECM, 200x100	V.17 14400	1
223	Hewlett Packard Fax 920	MR, ECM, 200x100	V.17 14400	1

Table 4 G3FE Test Report (cont'd)

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
224	Hewlett Packard Fax 200	MR, ECM, 200x100	V.29 9600	1
225	Hewlett Packard LaserJet 3200	MR, ECM, 200x100	V.17 14400	1
226	Hewlett Packard OfficeJet	MR, ECM, 200x100	V.29 9600	1
227	Hewlett Packard OfficeJet 350	MR, ECM, 200x100	V.29 9600	1
228	Hewlett Packard Office Jet 570	MR, ECM, 200x100	V.17 14400	1
229	Intel SatisFAXtion 400e	MR, ECM, 200x100	V.29 9600	1
230	Konica 7310	MR, ECM, 200x100	V.29 9600	1
231	Lumina 2096	MR, ECM, 200x100	V.29 9600	1
232	Megahertz PCMCIA card	MR, Non-ECM, 200x100	V.17 14400	2
233	Minolta 3300	MR, Non-ECM, 200x100	V.29 9600	1
234	Mita LDC 570	MR, ECM, 200x100	V.17 14400	1
235	Mita TC 750	MR, ECM, 200x100	V.17 14400	1
236	Monroe MX 4020	MR, ECM, 200x100	V.29 9600	1
237	Motorola CELLect 14.4 (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
238	Motorola Power 14.4 (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
239	Motorola Power 14.4 (WinFax)	MR, ECM, 200x100	V.17 14400	1
240	Motorola UDS 14.4 (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
241	Muratec F150	MR, ECM, 200x100	V.17 14400	1
242	Muratec F56	MR, ECM, 200x100	V.17 14400	1
243	Muratec F90	MR, ECM, 200x100	V.17 14400	1
244	NEC Nefax 480	MR, ECM, 200x100	V.17 14400	1
245	New media 14.4 PCMCIA (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
246	Okidata OkiFax 1000	MR, ECM, 200x100	V.29 9600	1
247	Okidata OkiFax 2200	MR, ECM, 200x100	V.29 9600	1
248	Okidata OkiOffice 84	MR, ECM, 200x100	V.17 14400	1
249	Olivetti OFX-1000	MR, ECM, 200x100	V.29 9600	1
250	Olivetti OFX 3100	MR, ECM, 200x100	V.29 9600	1
251	Panasonic KX F1600	MR, Non-ECM, 200x100	V.29 9600	1
252	Panasonic KX F3000	MR, Non-ECM, 200x100	V.29 9600	1
253	Panasonic KX F500	MR, Non-ECM, 200x100	V.29 9600	1
254	Panasonic KX F580	MR, Non-ECM, 200x100	V.29 9600	1
255	Panasonic KX FP 270	MR, Non-ECM, 200x100	V.17 14400	2
256	Panasonic KX FP C95	MR, Non-ECM, 200x100	V.17 14400	2
257	Panasonic PX 150	MR, ECM, 200x100	V.29 9600	1
258	Panasonic PX 350	MR, ECM, 200x100	V.29 9600	1
259	Panasonic PX 5	MR, ECM, 200x100	V.29 9600	1
260	Panasonic UF 880	MR, ECM, 200x100	V.17 14400	1
261	Panasonic UF V60	MR, ECM, 200x100	V.29 9600	1
262	Pitney Bowes 8050	MR, ECM, 200x100	V.29 9600	1
263	Practical Peripherals V.32bis	MR, ECM, 200x100	V.17 14400	7

Table 4 G3FE Test Report (cont'd)

Test No	G3FE Profile	Setting		FOM
		Profile	Speed	
264	Ricoh 180	MR, ECM, 200x100	V.29 9600	1
265	Ricoh 3500L	MR, ECM, 200x100	V.17 14400	1
266	Ricoh Fax 240	MR, ECM, 200x100	V.29 9600	1
267	Ricoh Fax 3000L	MR, ECM, 200x100	V.29 9600	1
268	Samsung FX 1502	MR, Non-ECM, 200x100	V.29 9600	1
269	Sanyo SFX 11	MR, ECM, 200x100	V.29 9600	1
270	Sanyo SPF 301	MR, ECM, 200x100	V.29 9600	1
271	Scout 14.4 PCMCIA	MR, ECM, 200x100	V.17 14400	1
272	Sharp FO 5400	MR, ECM, 200x100	V.17 14400	1
273	Sharp UX 108	MR, Non-ECM, 200x100	V.29 9600	1
274	Sharp UX 1400	MR, ECM, 200x100	V.17 14400	1
275	Sharp UX 3600M	MR, ECM, 200x100	V.17 14400	1
276	Sharp UX 460	MR, Non-ECM, 200x100	V.29 9600	1
277	Supra 28.8 MacIntosh	MR, ECM, 200x100	V.17 14400	1
278	Telecom AM 11	MR, Non-ECM, 200x100	V.29 9600	1
279	Telecom NP 80	MR, Non-ECM, 200x100	V.29 9600	1
280	Toshiba TF 231	MR, Non-ECM, 200x100	V.29 9600	1
281	Toshiba TF 421	MR, ECM, 200x100	V.29 9600	1
282	Toshiba TF 671	MR, ECM, 200x100	V.17 14400	1
283	US Robotics Sportster 14.4 (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
284	US Robotics WorldPort PCMCI (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
285	US Robotics 33.6 Mdl 1172 (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
286	US Robotics 33.6 Mdl 1172 (WinFax)	MR, ECM, 200x100	V.17 14400	1
287	Viva 14.4 Fax Modem	MR, Non-ECM, 200x100	V.17 14400	1
288	Xerox 3004	MR, ECM, 200x100	V.17 14400	1
289	Xerox 7021	MR, ECM, 200x100	V.29 9600	1
290	Xerox 7024	MR, ECM, 200x100	V.17 14400	1
291	Xerox 7033	MR, ECM, 200x100	V.29 9600	1
292	Xerox Work Center 250	MR, ECM, 200x100	V.29 9600	1
293	Xerox Work Center 470cx	MR, ECM, 200x100	V.17 14400	1
294	Xerox Work Center 480cx	MR, ECM, 200x100	V.17 14400	1
295	Xerox Work Center XK50cx	MR, ECM, 200x100	V.17 14400	1
296	Zoom Telephonics 14.4 Internal (FaxTalk)	MR, ECM, 200x100	V.17 14400	1
297	Zoom Telephonics 9600 Internal (FaxTalk)	MR, ECM, 200x100	V.29 9600	1
298	Zoom Telephonics V.32 bis (FaxTalk)	MR, ECM, 200x100	V.17 14400	1

3 Reference Equipment

This chapter gives an overview of the reference equipments utilized for the interoperability tests.

3.1 G3FE Reference Equipment

Appendix I gives an overview of the FaxLab G3FE emulations for the T.38 End-to-End interoperability tests. A detailed description of each G3FE profile can be found in the FaxLab Emulation Reference Manual [8].

3Com EtherLink III LAN + 33.6
AT&T 9015 PF
AT&T Data Port
AT&T PPF200
Boca MV.34E
Brother 6650MC
Brother 7150C
Brother Fax-190
Brother Fax-580MC
Brother Intellifax 600
Brother Intellifax 625
Brother Intellifax 950M
Brother Intellifax 2500
Brother MFC4550
Brother MFC4600
Brother MFC4650
Canon B70
Canon Fax 750
Canon Fax B340
Canon L777
Canon MultiPASS C530
Canon MultiPASS C545
Canon MultiPASS C555
Canon MultiPASS C560
Canon MultiPASS C755
Canon MultiPASS C2500
Canon MultiPASS C5500
Canon MultiPASS L6000
Canon Fax TF-301
Cardinal FaxTalk
Compaq 9600 PCMCIA
Dex 85
Eiger 14.4 PCMCIA
Fujitsu Dex 740
Gammalink Fax Modem
Global Village Teleport Bronze II
Pamasonic KXF-3000
Panasonic KX-FP270
Panasonic KX-FPC95
Panasonic PX-5
Panasonic PX-150
Panasonic PX-350
Panasonic UF-880
Panasonic UF-V60
Pitney Bowes 8050
Practical Peripherals V.32bis
Ricoh 180
Ricoh 3500L
Ricoh Fax 240
Ricoh Fax 3000L
Ricoh RF-05
Scout 14.4 PCMCIA
Samsung FX-40
Samsung FX-1502
Sanyo SFX 11
Sanyo SPF-301
Sharp FO-145
Sharp FO-235
Sharp FO-445
Sharp FO-5400
Sharp UX-104
Sharp UX-108
Sharp UX-117
Sharp UX-256
Sharp UX-460
Sharp UX-1400
Sharp UX-3600M
Supra 28.8 MacIntosh
Supra FAX Modem V.32 bis (FaxTalk)
Supra FAX Modem V.32bis (WinFax)
T.30 Synthesized Profile
Telecom AM-11

Hayes JetFax
Hayes Optima 14.4
Hewlett Packard Fax-200
HP Fax 920
HP LaserJet 3200
Hewlett Packard OfficeJet
HP OfficeJet 350
HP OfficeJet 570
Intel SatisFAXtion /400e
Konica 7310
Lumina 2096
Megahertz PCMCIA Card
Minolta 3300
Mita LDC-570
Mita LDC-750
Mita TC-170
Monroe MX-4020
Motorola CELLect 14.4
Motorola Power 14.4 (BitFax)
Motorola Power 14.4 (FaxTalk)
Motorola Power 14.4 (FaxWorks)
Motorola Power 14.4 (Quicklink)
Motorola Power 14.4 (WinFax)
Motorola USD 14.4
Muratec Imagmate CX
Muratec F-56
Muratec F-90
Muratec F-150
Muratec FM-820
NEC Nefax 480
NEC SilentWriter 95
New Media 14.4 PCMCIA
Okidata OKIFax 1000
Okidata OKIFax 2200
Okidata OKIOffice 84
Olivetti OFX-1000
Olivetti OFX-3100
Panasonic KXF-500
Panasonic KXF-580
Panasonic KXF-1600
Telecom NP-80
Toshiba TF-231
Toshiba TF-421
Toshiba TF-501
Toshiba TF-671
US Robotics Sportster
US Robotics Sportster 14.4 Internal
US Robotics Sportster 28.8 (MacIntosh)
US Robotics 33.6 Mdl 1172 (FaxTalk)
US Robotics 33.6 Mdl 1172 (Microsoft Fax)
US Robotics 33.6 Mdl 1172 (WinFax Pro V7.5)
US Robotics WorldPort PCMCIA
Viva 14.4 Fax Modem
Xerox 3004
Xerox 7021
Xerox 7024
Xerox 7033
Xerox WorkCenter 250
Xerox WorkCenter 470cx
Xerox WorkCenter 480cx
Xerox WorkCenter XE90fx
Xerox XK50cx
Zoom Telephonics 14.4 Internal
Zoom Telephonics 9600 Internal
Zoom Telephonics V.32 bis
ZyXEL Omni 288s
ZyXEL U-1496E

4 Known Issues

This chapter gives an overview about known issues on T.38 interoperability.

4.1 Known G3FE Issues

Table 5 Open G3FE Issues

Description of Open Issues	Remarks
Fujitsu Dex 85 does not pass the End-to-End test.	Open
Practical Peripherals V.32 bis does not pass the End-to-End test.	Open

Literature References

[1] VINETIC® Device Driver Prel. User's Manual Driver and API Description Rev. 1.0, 2006-03-10

[2] T.38 Fax Agent Release 1.1 User's Manual Programmer's Reference Rev. 1.0, 2005-09-22

[3] T.38 Protocol Stack Release 1.16 User's Manual Programmer's Reference Rev. 1.0, 2005-09-22

[4] T.38 Test Application User's Manual Programmer's Reference Rev. 1.0, 2006-04-28

[5] VINETIC® Device Driver Release Notes

[6] VINETIC® System Package Release Notes

[7] EASY 334 Tool Package Version 1.0 Getting Started Rev. 6.0, 2005-05-19

[8] Quality Logic, FaxLab Emulation Reference Manual

Attention: Please refer to the latest revision of the documents.

Standard References

[9] ITU-T Recommendation T.38, (09/2005), Procedures for real-time Group 3 facsimile communication over IP networks

[10] ITU-T Recommendation E.453, (08/94), Facsimile image quality as corrupted by transmission-induced scan line errors

[11] ITU-T Recommendation E.458, (02/96), Figure of merit for facsimile transmission performance

Terminology

A	
A/D	Analog to Digital
AAL2	ATM Adaptation Layer 2
AC	Alternative Current
ADC	Analog Digital Converter
AITDF	Advanced Integrated Test and Diagnostic Functions
ALM	Analog Line Module
ATA	Analog Telephony Adaptor
ATD	Answering Tone Detector
ATM	Asynchronous Transfer Mode
C	
CAS	Channel Associated Signaling
CNG	Comfort Noise Generation
Codec	Coder Decoder
CPE	Customer Premises Equipment
CRAM	Coefficient RAM
D	
DAC	Digital Analog Converter
DC	Direct Current
DCCTL	DC Control
DSP	Digital Signal Processor
DTMF	Dual Tone Multi Frequency
E	
EDSP	Enhanced Digital Signal Processor
EXP	Expander
F	
FOM	Figure Of Merit
FRR	Frequency Response Receive filter
FRX	Frequency Response Transmit filter
FSK	Frequency Shift Keying
FTTH, FTH	Fiber To The Home
G	
G3FE	Group 3 Facimile Equipment
GPIO	General Purpose Input / Output
H	
HW	Hardware
I	
IAD	Integrated Access Device
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ITU	International Telecommunication Union

J	
JTAG	Joint Test Action Group
L	
LSSGR	Local area transport access Switching System Generic Requirements
M	
MTA	Media Terminal Adapter
N	
NG-DLC	Next Generation Digital Loop Carrier
NT	Network Terminal
O	
ONT	Optical Network Terminal
P	
PBX	Private Branch eXchange
PCM	Pulse Code Modulation
POTS	Plain Old Telephone Service
R	
RAM	Random Access Memory
RBS	Robbed Bit Signaling
RTCP	Real-time Transport Control Protocol
RTP	Real-time Transport Protocol
S	
SLIC	Subscriber Line Interface Circuit
SOHO	Small Office / Home Office
SUT	System Under Test
T	
TDM	Time Division Multiplex
TG	Tone Generator
TH	Transhybrid Balancing
TS	Time Slot
TTX	Teletax
U	
UTD	Universal Tone Detection
V	
VAD	Voice Activity Detection
VINETIC®	Voice and Internet Enhanced Telephony Interface Circuit
VINETICOS	Voice and Internet Enhanced Telephony Interface Circuit Coefficients Software
VoATM	Voice over ATM
VoDSL	Voice over DSL
VoIP	Voice over IP
W	
WLL	Wireless Local Loop
X	
xDSL	(all flavors of) Digital Subscriber Line

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